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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,990	01/19/2005	Anders Thornell-Pers	48586.830005.US0	1938

26582 7590 09/19/2006

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EXAMINER	
MOE, AUNG SOE	
ART UNIT	**PAPER NUMBER**
2618	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/521,990	THORNELL-PERS, ANDERS	
	Examiner	Art Unit	
	Aung S. Moe	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *see attached*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show detail description as described in the specification (i.e., In Fig. 2, the box labeled as "2" is unclear what it's) . Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 25-27, 29-31, 33, 39-40, and 42-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Hareyama (U.S. 6,538,506).

Regarding claim 25, Hareyama '506 discloses a method for improvement of the efficiency of a power amplifier (i.e., noted the Power Amplifier 1 as shown in Fig. 1; see col. 3, lines 5+ and noted the improvement for the efficiency of the power amplifier 1 as shown in table 3) utilized for transmission of radio signals in a portable radio communication device (i.e., see col. 4, lines 1-4), comprising the steps of:

establishing a required transmission power of said portable radio communication device (i.e., as shown in Fig. 1 and further discussed in col. 4, lines 5+ that the CPU 8 of the portable wireless telephone as shown in Fig. 1 is establishing a required transmission power of the mobile phone by providing the instruction signal to the power detection section 14 respectively);

determining a desired load impedance that gives an optimal efficiency of said power amplifier for said required transmission power (i.e., as shown in Fig. 1 and further discussed in col. 4, lines 10+ and col. 6, lines 35+ that the CPU is determined a desired load impedance for

the best efficiency of the Power Amplifier 1 based on the instruction received by the CPU 8 from the base station 11 and the Table 3 as shown in col. 6); and

controlling the radiating impedance of an antenna (4) element loading said power amplifier (1) in dependence of said desired load impedance (i.e., as discussed in col. 4, lines 10+ and col. 5, lines 45+ that the CPU 8 is controlling the radiation impedance of the antenna 4 by loading the power amplifier 1 base on the desired load impedance by use of Tables 1-3 and the instruction received from the base station 11).

Regarding claim 26, Hareyama '506 discloses wherein said step of controlling is followed by a step of adaptively controlling said arrangement in dependence of a power output from said power amplifier to increase said power output (i.e., as shown in Figs. 1-4 and Tables 1-3 that the power amplifier 1 is controlled by the CPU 8 based on the power output of the amplifier 1 to increase to the maximum output power; see col. 7, lines 20+).

Regarding claim 27, Hareyama '506 discloses wherein said step of establishing comprises reading out a control signal fed to said power amplifier **or** reading out the required output power defined by a base station (i.e., as shown in Fig. 1 and Tables 1-3, the CPU 8 is establishing the required transmission power of the portable wireless phone either by providing a power control signals to the element 16 based on the instruction received from the based station 11 or the information readout from the TABLES 1-3; see col. 4, lines 10+).

Regarding claim 29, Hareyama '506 discloses wherein said step of determining a desired load impedance comprises retrieving said desired load impedance corresponding to said required

transmission power from a look-up table (i.e., Noted the use of TABLES 1-3 as shown and discussed in col. 5 and col. 6, line 5+).

Regarding claim 30, Hareyama '506 discloses a method for improvement of the efficiency of a power amplifier utilized for transmission of radio signals in a portable radio communication device (i.e., noted the Power Amplifier 1 of the portable wireless device as shown in Fig. 1; see col. 3, lines 5+; and noted the improvement for the efficiency of the power amplifier 1 as shown in table 3), comprising the steps of:

determining a power output from said power amplifier (i.e., as shown in Figs. 1-4 and 8, the elements 2, 3 and 17 are used to determine the power output form the power amplifier 1 respectively by the CPU 8 and Detection unit 14); and

controlling the radiating impedance of an antenna element (4) loading said power amplifier (1) adaptively in dependence of said power output from said power amplifier to increase said power output (i.e., based on the power output data detected by the coupler 17 and matching circuit 3 of the power detection 14, the CPU 8 is controlling the radiating impedance of the antenna 4 to increase to the maximum output power; see col. 4, lines 24-45 and col. 7, lines 20+).

Regarding claim 31, Hareyama '506 discloses wherein said step of controlling comprises changing a capacitive coupling between said antenna element and a ground element (i.e., noted the capacitive C3/C3' as shown in Figs. 2-4, which is coupling between the antenna 4 and the ground).

Regarding claim 33, Hareyama '506 discloses wherein said capacitive coupling is changed by connecting or disconnecting a capacitance (i.e., as shown in Fig. 3, the capacitive C3/C3' is changed by connecting or disconnecting by the switch S2).

Regarding claim 39, Hareyama '506 discloses an arrangement for improvement of the efficiency of a power amplifier utilized for transmission of radio signals in a portable radio communication device (i.e., noted the Power Amplifier 1 of the portable wireless device as shown in Fig. 1; see col. 3, lines 5+ and noted the improvement for the efficiency of the power amplifier 1 as shown in table 3), comprising:

a means for establishing a required transmission power of the portable radio communication device (i.e., as shown in Fig. 1 and further discussed in col. 4, lines 5+ that the CPU 8 of the portable wireless telephone as shown in Fig. 1 is establishing a required transmission power of the mobile phone by providing the instruction signal to the power detection section 14 respectively);

a means for determining a desired load impedance that gives an optimal efficiency of said power amplifier for said required transmission power (i.e., as shown in Fig. 1 and further discussed in col. 4, lines 10+ and col. 6, lines 35+ that the CPU is determined a desired load impedance for the best efficiency of the Power Amplifier 1 based on the instruction received by the CPU 8 from the base station 11 and the Table 3 as shown in col. 6);

an antenna element (4) connected to an output of said power amplifier (1); and

a control unit for controlling the radiating impedance of the antenna element (4) loading said power amplifier (1) in dependence of said desired load impedance (i.e., as discussed in col.

4, lines 10+ and col. 5, lines 45+ that the CPU 8 is controlling the radiation impedance of the antenna 4 by loading the power amplifier 1 base on the desired load impedance by use of Tables 1-3 and the instruction received from the base station 11).

Regarding claim 40, Hareyama '506 discloses wherein said means for establishing a required transmission power comprises a read out device for reading out a power control signal fed to said power amplifier **or** a read out device for reading out the required output power defined by a base station (i.e., as shown in Fig. 1 and Tables 1-3, the CPU 8 is establishing the required transmission power of the portable wireless phone either by providing a power control signals to the element 16 based on the instruction received from the based station 11 **or** the information readout from the TABLES 1-3; see col. 4, lines 10+).

Regarding claim 42, Hareyama '506 discloses wherein said means for determining a desired load impedance comprises a look-up table containing correspondence between desired load impedance and required transmission power (i.e., Noted the use of TABLES 1-3 as shown and discussed in col. 5 and col. 6, line 5+).

Regarding claim 43, Hareyama '506 an arrangement for improvement of the efficiency of a power amplifier utilized for transmission of radio signals in a portable radio communication device (i.e., noted the Power Amplifier 1 of the portable wireless device as shown in Fig. 1; see col. 3, lines 5+; and noted the improvement for the efficiency of the power amplifier 1 as shown in table 3), comprising:

a means for determining a power output from said power amplifier (i.e., as shown in Figs. 1-4 and 8, the elements 2, 3 and 17 are used to determine the power output form the power amplifier 1 respectively by the CPU 8 and Detection unit 14);

an antenna element (4) connected to an output of said power amplifier (1); and

a control unit (i.e., the CPU 8) for controlling the radiating impedance of the antenna element (4) loading said power amplifier in dependence of said power output from said power amplifier (1) to increase said power output (i.e., based on the power output data detected by the coupler 17 and matching circuit 3 of the power detection 14, the CPU 8 is controlling the radiating impedance of the antenna 4 to increase to the maximum output power; see col. 4, lines 24-45 and col. 7, lines 20+).

Regarding claim 44, Hareyama '506 discloses wherein said device comprises a capacitive element connected to a ground element (i.e., noted the capacitive element C3' as shown in Fig. 3), wherein said control unit (8) is arranged to control a coupling of said capacitive element (C3') to said antenna element (i.e., with the use of switch 4, the CPU 8 is controlling the coupling of the capacitive element C3' to the antenna 4).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 34, 35 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hareyama '506 in view of Jackson et al. (U.S. 6,061,025).

Regarding claim 34, it is noted that Hareyama '506 does not explicitly show changing of the size of the antenna element as required by the present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Jackson '025. In particular, Jackson '025 teaches the changing of the changing of the size of the antenna element (i.e., noted the antenna 50 and conduction elements 52, 54, 56 and 58, 60 and 62 as shown in Fig. 5) by connecting/disconnecting the conductive element by using a switches 100-102 respectively, in order to provide electronically tunable antennas that can be scaled for various frequency bands.

In view of the above, having the system of Hareyama '506 and then given the well-established teaching of Jackson '025, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Hareyama '506 as taught by Jackson '025, since Jackson '025 stated in col. 2, lines 5+ that such a modification would provide electronically tunable antennas that can be scaled for various frequency bands.

Regarding claim 35, the combination of Hareyama '506 and Jackson '025 teaches that wherein said size is changed by connecting a conductive element (i.e., see Fig. 5 of Jackson '025, the elements 52, 54, 56 and 58, 60 and 62) to said antenna element or disconnecting the

conductive element from said antenna element (i.e., noted the use of switches 100-102 as shown in Fig. 5 for changing the size of the antenna).

Regarding claim 46, it is noted that claim 39 is corresponding to the claims 34-35 as discussed above; thus, claim 46 is rejected for the same reasons as discussed for claims 34-35 as indicated above.

6. Claims 36 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hareyama '506 in view of Matsuyoshi et al. (U.S. 6,549,169).

Regarding claim 36, it is noted that Hareyama '506 does not explicitly show adjusting comprises adjusting the length of **a slit** of said antenna element.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Matsuyoshi '169. In particular, Matsuyoshi '169 teaches that it is conventionally well known in the art at the time to the invention was made to adjust the length of a slit of the antenna element in order to so that the broad band for the antenna can be realized (i.e., as shown in Figs. 8, the length of the slit 7 can be adjusted to change the resonance frequency by connecting or disconnecting the switching circuit 121/122 so that broad band for the antenna can be realized; see col. 10, lines 35-68 and col. 11, lines 1-50).

In view of the above, having the system of Hareyama '506 and then given the well-established teaching of Matsuyoshi '169, it would have been obvious to one having ordinary skill

in the art at the time of the invention was made to modify the system of Hareyama '506 as taught by Matsuyoshi '169, since Matsuyoshi '169 stated in col. 11, lines 35+ that such a modification would change the resonance frequency of the antenna so that broad band for the antenna can be realized.

Regarding claim 48, it's noted that Hareyama '506 does not explicitly show a switch arranged to adjust the length of a slit in said antenna element.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Matsuyoshi '169. In particular, Matsuyoshi '169 teaches that it is conventionally well known in the art at the time to the invention was made to a switch (i.e., see Fig. 8, element 121) arranged to adjust the length of a slit in said antenna element in order to realize the broad band for the antenna element in the mobile wireless communication device (i.e., as shown in Figs. 8, the length of the slit 7 can be adjusted to change the resonance frequency by connecting or disconnecting the switching circuit 121/122 so that broad band for the antenna can be realized; see col. 10, lines 35-68 and col. 11, lines 1-50).

In view of the above, having the system of Hareyama '506 and then given the well-established teaching of Matsuyoshi '169, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Hareyama '506 as taught by Matsuyoshi '169, since Matsuyoshi '169 stated in col. 11, lines 35+ that such a modification would change the resonance frequency of the antenna so that broad band for the antenna can be realized.

7. Claims 32 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hareyama '506 in view of Kim (U.S. 6,862,432).

Regarding claim 32, although Hareyama '506 discloses the capacitive (i.e., see Figs. 2-4; the elements C3/C3') is coupling to the antenna element 4, Hareyama '506 does not explicitly show varying the capacitance of a varactor to change the capacitive coupling to the antenna.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Kim '432. In particular, Kim '432 teaches that it is conventionally well known in the art at the time of the invention was made to couple the capacitive element, such as varactor (i.e., see Figs. 3 and 4, the varactor C3), to the antenna element 10 in the portable radio telephone (i.e., see Fig. 5) so that the capacitive coupling is changed by varying the capacitance of a varactor by the control unit (i.e., noted the CPU 30 and DAC 40 as shown in Figs. 1 and 3 is varying the capacitance of a varacotr C3; see col. 4, lines 30-45).

In view of the above, having the system of Hareyama '506 and then given the well-established teaching of Kim '432, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Hareyama '506 as taught by Kim '432, since Kim '432 stated in col. 1, lines 15+ such a modification would provide an optimal antenna impedance matching state in a portable radio telephone.

Regarding claim 45, it is noted that claim 45 is corresponding to claim 32 as discussed by claiming the use of well known a varactor in the portable radio communication device as taught by Kim '432. In view of this, claim 45 is rejected for the same reason as discussed for claim 32 above.

8. Claims 37-38 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hareyama '506 in view of McKinzie, III et al. (U.S. 2002/0057222).

Regarding claims 37 and 38, it is noted that Hareyama '506 does not explicitly show wherein said antenna element is provided on a **dielectric** body and said step of controlling comprises changing the dielectric factor by applying a control voltage over the dielectric body.

However, the above-mentioned claimed limitations are well known in the art as evidenced by McKinzie '222. In particular, McKinzie '222 teaches the use of a dielectric body (i.e., see Figs. 1 and 10-12, the elements 106 and 102; see paragraphs 0007, 00010, 0017, 0048 and 0053+) of the antenna element and applying a control voltage over the dielectric body to change the dielectric factor of the antenna (i.e., see paragraphs 0020, 0059, and 0061) in order to change the resonant frequency of the antenna.

In view of the above, having the system of Hareyama '506 and then given the well-established teaching of McKinzie '222, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Hareyama '506 as taught by McKinzie '222, since McKinzie '222 stated in paragraph 0003+ such a modification would minimize the size, weight and allow the antenna to operate in high band-width communication.

Regarding claim 47, it is noted that claim 47 is corresponding to claims 37-38 as discussed above. In view of this, claim 47 is also rejected for the same reasons as discussed above for claims 37-38 as set forth above.

9. Claims 28 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hareyama '506 in view of Iwatsuki (U.S. 6,571,087).

Regarding claim 41, it is noted that Hareyama '506 does not explicitly show a measure device for measuring an output voltage and an output current from said power amplifier as recited in present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Iwatsuki '087. In particular, Iwatsuki '087 teaches that it is conventionally known in the art at the time of the invention was made to use a measure device for measuring an output voltage (i.e., see Fig. 12, the elements 14L, 58, 15L and 16; see col. 6, lines 15-20 and col. 8, lines 65+) and an output current from said power amplifier (i.e., noted the devices 13H/66 and 16 for measuring the output current from the power amplifier 11/29) in the radio communication device as recited in present claimed invention.

In view of the above, having the system of Hareyama '506 and then given the well-established teaching of Iwatsuki '087, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Hareyama '506 as taught by Iwatsuki '087, since Iwatsuki '087 stated in col. 2, lines 60+ such a modification would increase the level difference of the transmission power levels in the different modes.

Regarding claim 28, it is noted that claim 28 is corresponding to claim 41 as discussed above. In view of this, claim 28 is also rejected for the same reasons as discussed above for claim 41 as set forth above.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 20020193088A1 US 20030160728A1 US 20020183013A1 US006678506B1

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 571-272-7314. The examiner can normally be reached on Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Aung S. Moe
/Primary Examiner
Art Unit 2618

A. Moe
September 14, 2006